

IN THE CLAIMS:

Please cancel claims 1-9, without prejudice or disclaimer.

Please add new claims 10-29 as follows:

Claims 1-9 (canceled).

10. (new) A method of using the Earth mantle substance to produce hydrogen, the method comprising the steps of:

inserting a plurality of wells into the mantle substance;

forming a reaction cavity in the mantle substance, wherein the reaction cavity includes a reaction cavity surface;

applying water through a first well to the reaction cavity to interact with intermetallic compounds contained in the mantle substance, thereby causing a reaction of the water with the intermetallic compounds to release hydrogen;

controlling the release of the hydrogen by changing the water volume in the reaction cavity;

regenerating the reaction cavity surface involved in the reaction; and

extracting the hydrogen out of a second well.

11. (new) The method according to claim 10, wherein the step of inserting the plurality of wells includes drilling.

12. (new) The method according to claim 11, wherein the step of inserting the plurality of wells includes drilling using turbodrills.

13. (new) The method according to claim 10, wherein the step of forming the reaction cavity includes the step of:

establishing a linkage between the first and second wells, wherein the linkage includes the reaction cavity.

14. (new) The method according to claim 12, wherein the step of forming the reaction cavity includes the step of:

drilling a linkage between the first and second wells using the turbodrills, wherein the linkage includes the reaction cavity.

15. (new) The method according to claim 10, wherein the step of forming the reaction cavity includes the step of:

reaming at least one of the first and second wells.

16. (new) The method according to claim 12, wherein the step of forming the reaction cavity includes the step of:

reaming at least one of the first and second wells using the turbodrills.

17. (new) The method according to claim 15, wherein the step of reaming is performed by explosion of explosive materials.

18. (new) The method according to claim 10, wherein the step of regenerating the reaction cavity surface is performed periodically.

19. (new) The method according to claim 10, wherein the step of regenerating the reaction cavity surface is performed by high-pressure water flow.
20. (new) The method according to claim 19, further comprising the steps of:
installing a nozzle in the reaction cavity for providing the high-pressure water flow.
21. (new) The method according to claim 20, wherein the step of installing includes:
installing the nozzle using a remotely controlled manipulator system.
22. (new) The method according to claim 10, further comprising:
installing a separator to divide the released hydrogen from any water vapors.
23. (new) The method according to claim 22, wherein the released hydrogen is in gaseous form prior to division from the water vapors by the separator.
24. (new) The method according to claim 22, wherein the separator is installed on the second well.
25. (new) The method according to claim 22, wherein the separator is installed on an outlet associated with at least one of the plurality of wells.

26. (new) The method according to claim 10, further comprising:
utilizing heat energy discharged during the release of the hydrogen.

27. (new) An improved method of using the Earth mantle substance to produce hydrogen, including exploring continental and oceanic rifting areas supported by abnormal mantle diapirs with the mantle substance near the crust of the Earth; inserting a plurality of wells into the mantle substance; applying water through a water well of the plurality of wells to interact with intermetallic compounds contained in the mantle substance, thereby causing a reaction of the water with the intermetallic compounds to release hydrogen; and extracting the hydrogen out of a production well of the plurality of wells, the improvement comprising the steps of:

after inserting the plurality of wells into the mantle substance, forming a reaction cavity in the mantle substance, wherein the reaction cavity includes a reaction cavity surface;

controlling the release of the hydrogen by changing the water volume in the reaction cavity; and

regenerating periodically the reaction cavity surface involved in the reaction.

28. (new) The improved method of claim 28, wherein the step of forming the reaction cavity includes the step of:

establishing a linkage between the water well and the production well, wherein the linkage includes the reaction cavity.

29. (new) The improved method of claim 28, wherein the step of forming the reaction cavity includes the step of:

reaming at least one of the water well and the production well.